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SOCIAL BEHAVIOR OF MENTALLY RETARDED CHILDREN IN PUBLIC SCHOOL AND INSTITUTIONAL ENVIRONMENTS.

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RELATIONSHIPS BETWEEN MENTAL AGE LEVEL AND DEGREE OF SOCIAL PARTICIPATION IN TRAINABLE AND EDUCABLE MENTALLY RETARDED CHILDREN OF BOTH SEXES WERE INVESTIGATED. THE MAJOR OBJECTIVES WERE (1) TO ESTABLISH A GRADIENT OF SOCIAL PARTICIPATION IN MENTALLY RETARDED CHILDREN OF BOTH SEXES REPRESENTING PUBLIC SCHOOL AND INSTITUTIONAL ENVIRONMENT, (2) TO COMPARE THE SOCIAL PARTICIPATION OF TRAINABLE AND EDUCABLE GROUPS TO NORMS ESTABLISHED FOR CHILDREN OF NORMAL INTELLIGENCE, AND (3) TO RELATE DEGREES OF SOCIAL PARTICIPATION WITH THE EDUCATIONAL ENVIRONMENTS OF EDUCABLE AND TRAINABLE MENTALLY RETARDED CHILDREN. FOUR GROUPS OF MENTALLY RETARDED CHILDREN (120) WERE SELECTED FROM PUBLIC SCHOOL AND INSTITUTIONAL CLASSES. TWO GROUPS (TRAINABLE AND EDUCABLE) REPRESENTED PUBLIC SCHOOL CLASSES AND INSTITUTIONAL CLASSES. DURING THE 5-MONTH PILOT STUDY ALL GROUPS WERE OBSERVED AND THEIR BEHAVIOR WAS NOTED FOR A 1-MINUTE FREE PLAY PERIOD. THESE OBSERVATIONS WERE GATHERED AT WEEKLY AND SEMIWEEKLY INTERVALS. TRAINED OBSERVERS RATED THE BEHAVIOR OF THE SUBJECTS IN SUCH CATEGORIES AS UNOCCUPIED, SOLITARY, ONLOOKER, ASSOCIATIVE, OR COOPERATIVE. ALL GROUPS WERE AGAIN RATED AT THE END OF THE SCHOOL YEAR. AN ANALYSIS WAS MADE OF THE CHANGE IN RATINGS FOR ALL GROUPS FROM INITIAL TO FINAL SCORES. THE RESULTS OF THE FACTORIAL DESIGN DEMONSTRATED A STATISTICALLY SIGNIFICANT DIFFERENCE IN FAVOR OF EDUCABLE CHILDREN OVER TRAINABLE CHILDREN IN TOTAL PLAY BEHAVIOR SCORES. (GC)

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INTRODUCTION

Many authors in the field of child development have suggested that social participation and, more specifically, play behavior, is directly related to intellectual capacity. Whereas literature on the subject has been concerned with the findings of research with normal preschool and school-aged children, no study has previously been conducted relating to the play behavior of mentally retarded children.

It is the objective of this research to gather information to provide a better understanding of the functioning social levels of mentally retarded children. With such knowledge, it is believed that the educator may plan adequate and effective curricula geared to meet the needs of the mentally retarded and to foster social adaptability within the group. Since the general capacities of this group are rather strictly limited in scope, social adaptability is the commonly accepted goal for mental retardates.

Purpose of the Study

The general purpose of this study is to compare the free play behavior of Educable and Trainable boys and girls in Institutional and non-Institutional environments.

The specific purposes are:

1. to establish functioning levels of social participation for Educable and Trainable children of

both sexes, representing Institutional and non-Institutional settings;

2. to compare the levels of social functioning of Educable and Trainable boys and girls and subsequently to compare both groups to norms established for average to superior children of comparable mental ages;
3. to determine the effect of the number of siblings upon the social behavior of the subjects within the Educable and Trainable groups;
4. to ascertain the difference between the socio-economic status of Educable and Trainable children in Institutional and non-Institutional environments;
5. to compare the levels of social participation according to sex.

Definitions of Terms

The following definitions of terms were employed in this investigation:

Educable group.--The Educable group is defined as those mentally retarded boys and girls in Public School and Institutional classes with:

1. Intelligence Quotients from 45 to 75 inclusive, as measured by the 1937 revision of the Stanford-Binet Test of Intelligence, Form L;
2. Mental Ages within the range, 4-5 to 7-0;

3. Chronological Ages within the range, 7-0 to 12-6;
4. Freedom from gross physical and emotional handicaps.

Trainable group.--The Trainable group is defined as those mentally retarded boys and girls in Private Day School and Institutional classes with:

1. Intelligence Quotients from 20 to 55 inclusive, as measured by the 1937 revision of the Stanford-Binet, Form L;
2. Mental Ages ranging from 2-0 to 5-0;
3. Chronological Ages within the limits, 7-5 to 12-6;
4. Freedom from gross physical and emotional handicaps, biting, soiling.

Normal group.--This group is defined as those boys and girls selected for the Parten and Newhall study (27, p. 510 and p. 517) described in Figure 1. They are the children most nearly comparable to the total population in this investigation, according to Mental Age level, and meet the following criteria:

1. Intelligence Quotients from 90 to 130 inclusive, as measured by the Stanford-Binet Test, Form L;
2. Mental Age range of 1-9 to 5-10;
3. Chronological Age range of 2 to 4-6;
4. Freedom from physical or mental defect.

Obviously this group is representative of superior rather than normal children.

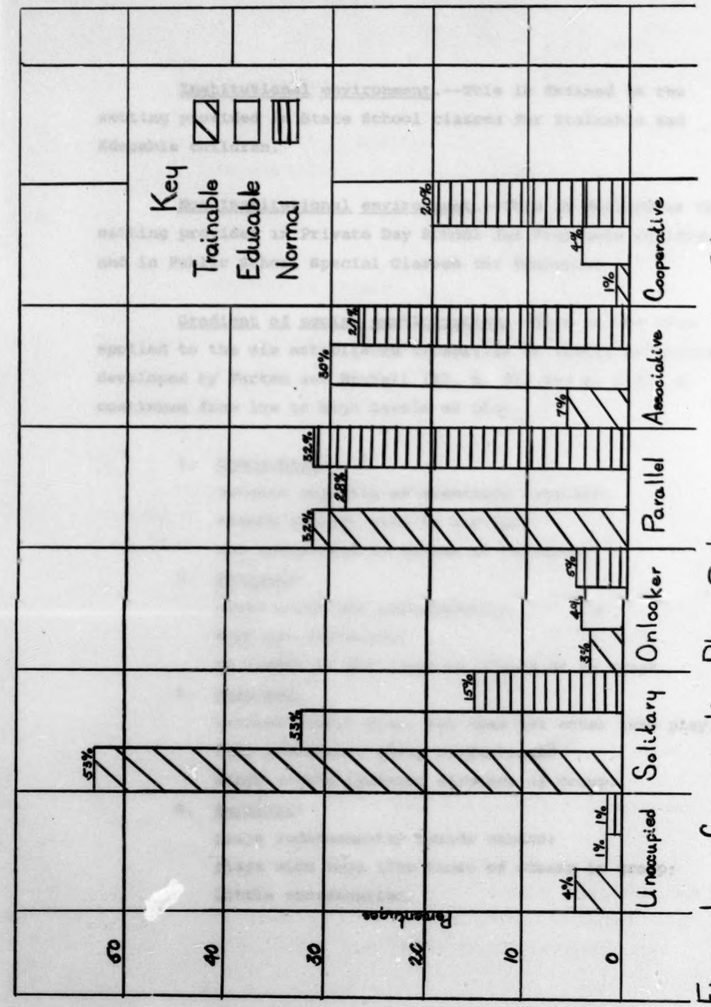

Figure 1. Comparative Play Behavior of Trainable, Educable and Normal Children (Parten and Newhall, 27)

Institutional environment.--This is defined as the setting provided in State School classes for Trainable and Educable children.

Non-Institutional environment.--This is defined as the setting provided in Private Day School for Trainable children and in Public School Special Classes for Educables.

Gradient of social participation.--This is the term applied to the six established categories of social participation developed by Parten and Newhall (27, p. 512 and p. 513), a continuum from low to high levels of play.

1. Unoccupied:
   watches anything of momentary interest;
   stands around, sits in one spot;
   not interested in groups of children.
2. Solitary:
   plays alone and independently;
   toys are different;
   no effort to get close to others or to speak.
3. Onlooker:
   watches others play, but does not enter into play;
   asks questions; gives suggestions;
   stays within speaking distance of group.
4. Parallel:
   plays independently beside others;
   plays with toys like those of others in group;
   little conversation.

5. Associative:
   borrowing and lending of play material;
   all engage in similar play;
   no one subordinates his interest to group.
6. Cooperative:
   organization, division of labor;
   subordination of individual desires to group;
   control of group by one or two.

The Parten and Newhall definitions of these categories are included in the Appendix.

Hypotheses

In comparing groups of normal children with mentally retarded children, in a free play setting, it has been hypothesized that:

I. Educable children of both sexes will have a higher degree of social participation than Trainable mentally retarded children;

II. Mentally retarded children of both sexes from non-Institutional situations will measure higher on the Gradient of Social Participation than mentally retarded children from Institutional situations;

III. Female subjects representing both Institutional and non-Institutional environments (Trainable and Educable) will perform significantly higher than males on the Gradient of Social Participation;

IV. Normal children of both sexes will measure higher on the Gradient of Social Participation than mentally retarded children;

V. Non-Institutional mentally retarded children of both sexes from families where there are siblings will display a higher degree of social participation than singletons.

REVIEW OF THE LITERATURE

Upon survey of the current literature in the area of mental retardation it has become quite apparent that there is a dearth of bona fide research, as Doll has conceived it, using both control and experimental groups (11, p. 309). Cruickshank, in a survey of this field conducted in 1951, sent forms to superintendents of 80 state training schools in the United States as listed in the Directory of the American Association on Mental Retardation. He found that only 20 actual research studies in 8 institutions were being conducted (11, p. 308-309). The result of similar forms sent to institutes of higher education, each represented by personnel in the Council on Teacher Education of the International Council for Exceptional Children, showed that only 45 of these institutions and the personnel in only 18 selected public school systems have published the results of research with mental retardates during the past ten years (11).

In the specific area of the play behavior and social adaptability of the mentally retarded, there is an even more noticeable lack of parallel or comparative research literature. Of the two studies most closely related to this topic, both are descriptive (9, 30).

The literature may be divided into three main classifications:

1. the development of social skills and attitudes;
2. the problem of adequate play and play equipment;

3. Institutional versus non-Institutional environment.

Development of Social Skills and Attitudes

Chamberlain (7) has found that mental retardates develop through play. Cleverdon and Rosenzweig report, "The 'all or nothing' philosophy of earlier days in this field is rapidly being abandoned in the face of accumulating evidence that retarded children possess resources that have not been developed . . ." (9, p. 57). Garrison has found that "sometimes the free play was very revealing as to the social needs and confusion of concepts of subjects. These unstructured situations provided opportunities for creating the desire for acceptance and the functioning of group approval and control" (17, p. 341).

Techniques such as paper and pencil questionnaires, visual aids, socio-dramas, group projects (free play, group games and social dancing), group discussions and individual conferences have promoted specific carry-over skills such as good personal appearance, manners, work habits, employer-employee relationships, and heterosexual relationships.

Fliegler (15), in testing beneficial results of dramatic play in a class with Intelligence Quotients ranging from 47 to 80 and Chronological Ages between 11 and 13, found that the children gained in language development, attained better expression in speaking, improved their auditory memory and motor ability, and acquired a feeling of achievement and independence. Their social interaction--ability to work together--was also improved.

Cleverdon and Rosenzweig (9) arrived at a number of interesting conclusions as a result of their study on the work-play progress of Trainable children.

The play activities of these children included discussions, music, dancing, story telling, cooking, woodworking, science, dramatic play, painting, and working with other art media. They found that these children frequently fear new equipment and that the introduction of such requires careful handling on the part of the instructor. The early joy derived by the retardate may come from manipulation of such equipment.

Although Fliegler (14) found that the mental age of the mental retardate had no consistent effect upon his interest patterns, Rosenzweig (30) categorized play development in the mentally retarded according to mental age. At approximately the mental age, 1-3, there is endless exercise of walking activities and picking up and throwing of objects. At mental age, 1-6, rapid shifts in attention take place. This is the age during which children get into everything, pull, carry, imitate and engage in solitary and onlooker types of play.

By the time the child reaches the mental age of 2-0, the attention shifts are less rapid. The child tends to dawdle, engage in more parallel play, and enjoy the company of other children; but treats them as physical objects. There is little social give-and-take but much pushing and shoving.

At a mental age, 3-0, dramatization and imagination enter their play activities. Toys become more complex, and there is less solitary play. At this point, too, children are more willing

to wait their turns and to begin cooperating in groups.

By the mental age of 4-0, mental retardates make more constructive use of materials. There is more manipulation and dramatization. Their ideas are complicated, but they are unable to carry them out and there is little carry-over from day to day. At this age, too, they are often bossy, silly, and very active.

By the mental age, 5-0, they like to cut out and paste things and work on a specific project. There is even some carry-over. They are more interested in finishing a project, and there is some rivalry introduced.

The data for this study were compiled from detailed observation of two groups of mental retardates with a mean chronological age of 7-11, and a mean intelligence quotient of 38. The range of chronological ages was from 5-1 to 15-4, and the intelligence quotient range was from 25 to 52.

Johnson (20) believes the objectives of an educational program for mentally handicapped children should stress occupational adequacy and social competence. The reason for modifying the educational program of the mentally retarded becomes clear when one views the differences between normal children and mental deficients in nursery schools. Kirk and Johnson (23) report that the mental retardates have a more limited scope of imagination, less originality and fewer expressive or creative activities. They need more adult guidance, cannot be hurried, and learn better through example rather than verbalization on the teacher's part. They repeat the pattern of their activities and tend to experiment with new things far less than do normal children.

Many fail to carry projects through to conclusions and fail to put their feelings into their art activities. Their best and most related dramatic play is in the area of home activities with which they are most familiar, such as cooking and doll playing.

The experimential scope of mentally retarded children may be widened by excursions and by the introduction of new and varied activities by the teacher. Two children engaged in parallel play may, with proper urging by the teacher, soon be playing together. Normal luncheon experiences stressing good manners, parties, playing with new types of toys and equipment, such as trains, help to broaden their activities.

The social goals for these children include getting along with their peers, working cooperatively with other individuals, and in groups. Past experience has shown that mentally retarded children who have been placed in situations with normal children need more help than those with less association with normal children. In order to compensate for their feelings of inferiority they frequently become either cowed or docile or over-aggressive.

"The behavior of the children in a classroom is related to the educational program designed to meet their needs. The activities in the classroom, the attitude of the teacher toward the children, and the curriculum; each has a bearing on the personality development and the behavior of the child in and out of the classroom" (23, p. 327).

Problem of Adequate Play and Play Equipment for the Mentally Retarded

Benoit says, " . . . it is undeniable that retarded children, especially those residing in training schools, have much less than their fair measure of play.

"No one has yet produced a book calculated to enlighten us on how to occupy retarded children in wholesome play during their leisure time" (1, p. 42).

Those who provide recreational facilities do not realize the needs of the mentally retarded. Toys designed for a two- or three-year-old, do not stand up under the handling of an eight- or ten-year-old. " . . . they (mental retardates) always more or less consciously nourish the secret wish to do the things they see done by children of their own age or size" (1, p. 43). Toy manufacturers, on the other hand, believe that the public would not buy items designed for mental retardates because of shame.

Many types of play activities are beyond the capacities of these children. Solitary activities, paper and pencil games, those involving reading, writing, numbers, or language are seldom, if ever, successful. "Furthermore, it is mostly in play activities that they can obtain the beneficial stimulation they require for their development; it is mostly in play that they can learn the skills that lie at the root of social living . . . it follows that failure to provide play for them can only lead to deterioration" (1, p. 45).

Because the potential accident factor looms large when dealing with individuals having large bodies and small minds, many schools hesitate to try new and varied experiences for these children. Many training schools do not have enough money for all of their necessities, let alone for extra play equipment. " . . . retarded children are not apt to have much fun out of anything without the cooperation of others. Furthermore, few toys can be safely admitted in a large group" (1, p. 48).

"Play has to enter more deeply into the training process for the retarded than the normal, owing to their psychological make-up" (1, p. 53). Among the most successful of these play activities are games such as bingo, storytelling with a great deal of action, and pictures. Mental retardates like to have the same stories told over and over in familiar words with great exaggeration of vocal and facial expressions and gestures. Television has become a valuable and educational medium, but it is no substitute for real play activities. Playground or free play study is invaluable--though not necessarily infallible--to the researcher since it is through this technique that more realistic measurements of the true nature of the mental retardate is discovered.

Institutional versus Non-Institutional Environment

No research studies in this topic are available, but two descriptive articles seem to demonstrate that social competence and intelligence may be dependent upon experiences and materials.

Mitchell says, "It seems likely that intellectual level may be a function of the amount of material available for learning and the types of learning that take place" (26, p. 687).

Cobb has found that mental deficients seem to develop their potentials more under home than institutional care:

> . . .we have already proved to our own satisfaction that many of our patients unable to be self-supporting can live very comfortably in private homes outside the institution. Our older men and women as well as the younger ones literally 'blossom' under the individual care and attention that can be offered in a home setting and greatly enjoy all aspects of community life. . . With our children we have already noticed many significant changes. Many of our youngsters seem more alert and have gained considerably in poise and self-confidence through opportunities which present themselves in a small group for self-expression and creative activity. . . . . In overactive children, we tend to notice that, after a period in family care, their activity becomes more directed, and nervousness decreases with the continued security of one substitute-mother and home (10, p. 665).

Summary

The available literature, of which there is a paucity, stresses the importance of play in creating valuable social behavior patterns among mental retardates. There is very little adequate equipment available for mentally retarded children.

There is some conflict between Fliegler and Rosenzweig regarding the effect of mental age on the interest patterns of mental retardates.

On the whole, only two studies, one by Rosenzweig and one by Cleverdon and Rosenzweig, even remotely parallel this study.

PROCEDURE

Selection of Population

In order to select a population for this study, three prerequisites seemed important so that generalization of results to other similar groups might be possible:

1. a public school system and an institution in which were enrolled a large enough number of educable and trainable mentally retarded boys and girls in order to make adequate statistical analyses;
2. a well-established special education program in which placement of pupils was made by qualified psychologists;
3. approximately equal preparation of the teachers in the education of the mentally retarded.

The public school system of a large city and a nearby State School, both in central New York State, met these considerations and were cooperatively interested. The city has a population of approximately 231,000, and is a center for diversified industry. The 37 elementary schools have a total population of 29,750. There are 22 classes for the educable mentally retarded. Each of the teachers has met the special requirements set up by New York State and placement of the children in classes is made by a qualified psychologist.

The State Institution has a school population of 350, with 23 classes of educable boys and 10 of educable girls; 1

class of trainable boys; and 3 classes of trainable girls. Placement of the children in classes is made by a qualified psychologist. The teachers have had specialized training in the education of the mentally retarded.

The Private Day School for the mentally retarded, supported by community funds, is incorporated by the Board of Regents of the State of New York, and has an enrollment of 95. The boys and girls are placed in educable or trainable classes, according to the results of psychological tests administered by a trained psychologist. The preparation of the teachers whose classes were observed met certification standards for elementary school teachers and all had participated in a workshop on the training of the mentally retarded.

Selection of Subjects

The plan of the study was to select four groups of mentally retarded boys and girls, a total of 120 subjects:

1. a group of 30 Educable children (15 boys, 15 girls) from the Public Schools;
2. a group of 30 Trainable children (15 boys, 15 girls) from the Private Day School;
3. a group of 30 Educable children (15 boys, 15 girls);
4. a group of 30 Trainable children (15 boys, 15 girls) both from the State Institution.

The records of all mentally retarded children at the State School and the Public Schools were examined and two groups of Educable children consisting of 77 boys (32 boys in Public Schools,

45 boys in the State School) and 64 girls (24 girls in Public Schools; 40 girls in the State School) were selected, who met the following criteria:

1. Intelligence Quotients (computed to March 31, 1957) 45 to 75, inclusive;
2. Mental Ages (computed to March 31, 1957) 4-5 to 6-8, inclusive;
3. Chronological Ages (computed to March 31, 1957) 7-4 to 12-2, inclusive;
4. freedom from gross physical or emotional handicaps.

The same procedure was followed in selecting the two Trainable groups comprising 39 boys (19 from the Private Day School, 20 from the Institution); and 36 girls (17 from the Day School, 19 from the Institution), using the following criteria:

1. Intelligence Quotients: 20 to 55, inclusive;
2. Mental Ages: 2-2 to 4-9, inclusive;
3. Chronological Ages: 7-4 to 12-2, inclusive;
4. freedom from gross physical or emotional handicaps, soiling, biting.

Stanford-Binet Intelligence Tests, Form L, were administered to all children whose date of testing was before January 1, 1956. Intelligence quotients and mental ages derived on or after this

date were used. All intelligence quotients, mental ages and chronological ages were reported to March 31, 1957.

A larger number of subjects was selected to insure the required sample numbers of 30, for it was felt that extenuating circumstances might interfere in the process of obtaining observations. Absence, due to outbreaks of ringworm, measles, colds, and chicken pox during the five months of observation (February through June) and discrepancies in intelligence quotient and mental age findings upon retesting with the Stanford-Binet, as well as the impossibility of testing several of the Trainable children, necessitated the dropping of many boys and girls as subjects.

Tables I and II, which give basic information on the Educable and Trainable groups--Chronological Age, Mental Age, Intelligence Quotient, Socio-economic Status and number of siblings--gives the experimental population after screening. The overlap of intelligence quotient of the two groups is explained by the fact that the psychologist recommended that these individual children would benefit most by being placed in either the Trainable or Educable group, according to the competencies observed in the diagnostic situation.

Instrumentation

The instrument used in rating the observations of the social behavior of the Educable and Trainable subjects in Institutional and non-Institutional environments was the social participation scale developed by Parten and Newhall (27, pp. 512 ff.) in observing preschool children of average and above-average

TABLE I

COLLECTIVE DATA FOR PUBLIC SCHOOL EDUCABLE BOYS AND GIRLS AND INSTITUTIONAL EDUCABLE BOYS AND GIRLS

School	Sex	Child	C.A.	M.A.	I.Q.	Socio-economic Status	Siblings
Public School	Boys	1	9- 3	5- 1	55	2+	2
		2	8- 3	6- 0	73	5+	3
		3	9- 9	5- 3	54	5+	8
		4	8- 3	5- 9	70	4-	2
		5	7-11	5- 9	73	4+	2
		6	9- 4	6- 4	68	5++	2
		7	10- 1	6- 8	66	5+	6
		8	8- 4	5-10	70	5+	6
		9	9-11	6- 5	65	5+	3
		10	8- 1	5- 4	66	4-	1
		11	8- 0	5- 0	63	1-	2
		12	8- 3	6- 1	74	3+	1
		13	9- 3	5- 8	61	5+	6
		$\bar{X}$	8-10	5- 9	66.0	60.8[a]	3.4
		σ	.7	.5	6.2	17.6	2.2
	Girls	1	8- 7	6- 1	71	5+	5
		2	10- 2	6- 1	60	5+	6
		3	8- 3	5- 3	64	5+	2
		4	9- 8	6- 2	64	3++	1
		5	8- 2	5- 9	70	4+	0
		6	7- 4	5- 4	73	5+	6
		7	7-10	5- 8	72	5+	6
		8	8- 4	5- 3	63	5-	1
		9	8- 8	5- 2	60	5-	0
		10	9- 0	5- 9	64	5+	6
		11	9- 9	6- 6	67	5+	10
		12	6- 8	6- 0	73	4+	2
		13	7-10	5- 9	73	4++	3
		14	9- 2	4-11	54	5-	2
		15	9- 0	6- 8	74	5	3
		$\bar{X}$	8- 8	5- 9	66.8	69.7[a]	3.5
		σ	.8	.5	5.9	11.5	2.8

TABLE I--Continued

School	Sex	Child	C.A.	M.A.	I.Q.	Socio-economic Status	Siblings
Institutional	Boys	1	7- 7	4- 5	58	5-	4
		2	8-11	5- 3	59	5+	2
		3	8- 2	5- 3	64	5+	2
		4	7-10	5- 1	65	5-	2
		5	8- 4	5- 0	60	5+	3
		6	9- 1	5-10	64	5+	3
		7	8- 9	5-11	68	5++	2
		8	8- 5	4- 8	55	5-	1
		9	11-10	6- 3	57	5-	5
		10	11- 3	6- 2	55	5-	4
		11	9- 8	4-10	50	5++	5
		12	8- 4	5- 4	53	5-	0
		13	10- 2	5-11	58	5-	6
		14	10- 1	4-10	48	4+	2
		15	10- 3	5- 5	53	5-	2
		$\bar{X}$	9- 1	5- 2	57.8	75.4[a]	2.9
		σ	1.2	.5	5.5	6.0	1.5
	Girls	1	9- 6	5- 7	59	5++	4
		2	8- 6	5- 1	60	5-	3
		3	10- 5	6- 6	62	5-	1
		4	11- 1	6- 3	56	5-	1
		5	9- 8	6- 6	67	5-	4
		6	10- 5	5- 4	51	5-	7
		7	7- 8	5- 7	73	5++	2
		8	10- 5	5-10	56	5-	7
		9	12- 2	6- 4	52	5-	3
		10	10- 4	5- 8	55	5-	7
		11	8- 7	4-10	56	5-	0
		12	11- 8	6- 5	55	5-	0
		13	8-11	4- 6	50	5-	9
		14	8-10	5- 0	57	5-	4
		15	11- 3	5- 4	47	5-	5
		$\bar{X}$	10-10	5- 7	57.1	78.5[a]	3.8
		σ	1.4	.6	6.1	4.4	2.7

[a]Converted to numerical equivalent scores according to Warner's Index of Social Class (34), see Figure 13.

TABLE II

COLLECTIVE DATA FOR INSTITUTIONAL TRAINABLE BOYS AND GIRLS AND PRIVATE DAY SCHOOL TRAINABLE BOYS AND GIRLS

School	Sex	Child	C.A.	M.A.	I.Q.	Socio-economic Status	Siblings
Institutional	Boys	1	10- 2	3- 0	30	3+	0
		2	9-10	3- 8	37	5-	3
		3	12- 5	2-11	25	5+	3
		4	10- 0	3- 0	30	5-	1
		5	12- 2	4- 0	33	5+	2
		6	8- 9	3-11	45	5-	2
		7	11- 9	4- 1	35	5-	3
		8	10-10	3-10	35	5-	2
		9	10- 3	2- 8	26	5-	2
		10	8- 2	3- 1	38	5-	0
		11	9- 7	3- 0	34	3++	2
		12	11- 3	4- 3	38	4	1
		13	11- 0	4- 3	39	5-	2
		14	8- 4	4- 0	48	5+	2
		15	12- 1	3- 1	27	5-	3
		$\bar{X}$	10- 5	3- 6	34.7	72.5[a]	1.9
		σ	1.3	.5	6.2	13.1	.9
	Girls	1	9- 2	2- 4	26	4-	4
		2	9- 1	2- 4	27	4++	6
		3	10- 3	2- 6	24	5-	1
		4	9-10	2- 6	26	4++	4
		5	8- 2	2- 7	32	4-	2
		6	11- 4	3- 0	26	4++	1
		7	10- 5	3- 4	32	4	3
		8	10- 1	2- 2	21	5-	2
		9	11- 9	2- 2	20	3++	1
		10	9- 6	3- 1	32	5-	0
		11	8- 2	4- 1	50	2-	10
		12	11- 3	4- 7	41	5-	5
		13	10- 2	3- 8	36	5-	5
		14	9- 6	3- 3	34	2++	2
		15	10-10	2- 4	22	3-	1
		$\bar{X}$	9-11	2-10	29.9	59.1[a]	3.1
		σ	1.0	.7	8.0	17.8	2.6

TABLE II--Continued

School	Sex	Child	C.A.	M.A.	I.Q.	Socio-economic Status	Siblings
Private Day School	Boys	1	8- 9	3- 3	37	3++	2
		2	9- 9	3- 4	34	4+	1
		3	10- 3	3- 9	37	4++	1
		4	8- 9	2- 8	25	3+	0
		5	10- 0	2- 9	27	3+	2
		6	8-10	3- 5	39	4++	4
		7	9- 4	4- 8	50	3-	1
		8	9- 6	3- 5	36	3-	3
		9	8- 9	4- 9	54	4+	2
		$\bar{X}$	9- 5	3- 7	37.7	50.2[a]	1.7
		σ	.5	.7	8.8	19.7	1.2
	Girls	1	7- 8	2- 5	31	4+	2
		2	10- 3	4- 1	40	4+	4
		3	9- 4	3- 5	37	2+	2
		4	7-10	2- 9	35	4+	2
		5	11- 1	3- 2	28	4+	1
		6	7- 5	3- 1	41	4++	6
		7	8- 2	3- 4	41	4+	2
		8	10- 7	4- 1	39	2-	3
		9	10- 4	3- 1	30	4++	1
		$\bar{X}$	9- 1	3- 4	35.8	52.0[a]	2.6
		σ	1.4	.5	4.6	10.7	1.4

[a]Converted to numerical equivalent scores according to Warner's Index of Social Class (34), see Figure 13.

intelligence. The six categories of social functioning, rather rigorously defined, are:

1. Unoccupied Behavior
2. Solitary Play
3. Onlooker Behavior
4. Parallel Play
5. Associative Play
6. Cooperative or Organized Play (Appendix)

This six-category scale, termed the Gradient of Social Participation, or Social Behavior Chart, was used in recording the behavior of the mentally retarded at 1-minute time intervals during free play periods.

The Socio-economic Status of the parents of each child was computed according to the method described by Warner, Meeker, and Eells in their book, Social Class in America (34). Their procedure in measuring social status involves three steps:

1. making primary ratings of the subject's Occupation, Source of Income, House Type, Dwelling Area, and Education;
2. securing weighted total of ratings;
3. converting the weighted total into social class form.

The Stanford-Binet Test of Intelligence, Form L, 1937 Revision, was used to measure intelligence.

To determine the number of siblings in the families of each child, school and institutional records were culled.

Administration and Scoring of Tests

Five months, February through June, 1957, were required to complete the psychological testing and observation of the play behavior of the Institutional and non-Institutional boys and girls.

All Stanford-Binet tests were administered and scored by the same psychologist and procedures given in the manual were carefully followed.

To insure uniformity in rating of the behavior of the children at 1-minute intervals during their free play periods, the three observers rated, first, nursery school children; then elementary school children, for a two-week period, using the six-category scale or Gradient of Social Participation; then discussed the results. At the end of this pilot period, rating agreement was unanimous, and the three investigators began a series of 80 observations on each child. At either semi-weekly or weekly intervals over a five-month period, the behavior of each child was noted for a 1-minute length of time and the rating made on the Social Gradient Scale. At the end of June, the number of observations under each play category on every child's record was counted. Then the sums of every play category were totaled for all groups: Institutional, non-Institutional, Trainable and Educable boys and girls.

Method of Analysis

To measure and compare the experimental populations of this investigation, factorial design (2 x 2 x 2) was utilized (see Table III). This particular analysis allowed for the statistical

Institution				non-Institution			
Trainable		Educable		Trainable		Educable	
Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
N 1...9	N 1...9	N 1...13	N 1...13	N 1...9	N 1...9	N 1...13	N 1...13
←			Total Score				→

Table III. Factorial Design -(2x2x2)

determination of differences in Total Play Behavior scores as measured by the Gradient of Social Participation among the following variables: Institutional and non-Institutional environments, Educable and Trainable mentally retarded groups, and male and female subjects.

This Total score was obtained by the assignment of weights, 1 through 6, summed, for the categories of play behavior:

Unoccupied	1
Solitary	2
Onlooker	3
Parallel	4
Associative	5
Cooperative	6

This represents a numerical scale, from low to high, following the Parten and Newhall degrees of social participation (see Appendix).

Analyses of socio-economic level compared Institutional and non-Institutional Educable and Trainable subjects by means of *t*- and F-tests.

In order to provide a further elaboration of the results, supplemental data are portrayed graphically in Figures 1 through 13 and Tables I through IV.

RESULTS

The analyses of the findings of this investigation are presented in two parts: Part I, dealing with the statistical results obtained through the utilization of the factorial design; and Part II, presenting the data in graphic form. All of these results are based upon the observations of Educable and Trainable children of both sexes representing Institutional and non-Institutional environments.

Part I

The order of presentation of results will parallel the numbered hypotheses given in the Introduction. For the computation of the factorial design, proportionate numbers were desirable; it was, therefore, necessary to omit, by random selection, 8 male and 10 female subjects.

The resulting population of 88 subjects was composed of the following:

1. Institutional
   a. 13 Educable boys
   b. 13 Educable girls
   c. 9 Trainable boys
   d. 9 Trainable girls

2. non-Institutional
   a. 13 Educable boys
   b. 13 Educable girls
   c. 9 Trainable boys
   d. 9 Trainable girls

Hypothesis I states that Educable children will display a higher degree of social participation than Trainable children (see Figure 1). Results of the statistical analysis demonstrate that this hypothesis may be accepted. Table IV shows that the difference between these groups is significant at the .001 level of confidence.

TABLE IV

ANALYSIS OF VARIANCE OF THE PLAY BEHAVIOR OF THE TOTAL POPULATION

Source		df	SS	MS	F
Total		87	322,133.46	3,702.68	
Between cells		7	141,992.88	20,284.70	
Between schools (A)		1	792.00	792.00	.035
Between groups (B)		1	81,885.13	81,885.13	36.36***
Between sexes (C)		1	17,983.68	17,983.68	7.99**
Interactions	A x B	1	24,099.22	24,099.22	10.70**
	A x C	1	804.04	804.04	.36
	B x C	1	16,399.00	16,399.00	7.28**
	A x B x C	1	100,029.81	100,029.81	44.42***
Within cells		80	180,140.58	2,251.76	

***Significant at less than the .001 level

**Significant at less than the .01 level

*Significant at less than the .05 level

Hypothesis II predicts that non-Institutional children will measure higher than Institutional children on the Gradient of Social Participation (see Figure 2). The results of the factorial design, however, demonstrate that this hypothesis may not be accepted. There is no significant difference between Institutional and non-Institutional mentally retarded groups (see Table IV).

Hypothesis III states that the total female population will score higher than the male population on the Gradient of Social Participation. Table IV shows this difference to be significant at the .01 level of confidence. This hypothesis is, therefore, upheld.

Part II

The findings presented in this section are based upon scores yielded by the total population, including the subjects dropped for the factorial design.

This population of 106 subjects includes:

1. Institutional
   a. 15 Educable boys
   b. 15 Educable girls
   c. 15 Trainable boys
   d. 15 Trainable girls

2. non-Institutional
   a. 13 Educable boys
   b. 15 Educable girls
   c. 9 Trainable boys
   d. 9 Trainable girls

To control for the unequal N's, percentage and/or mean scores are used.

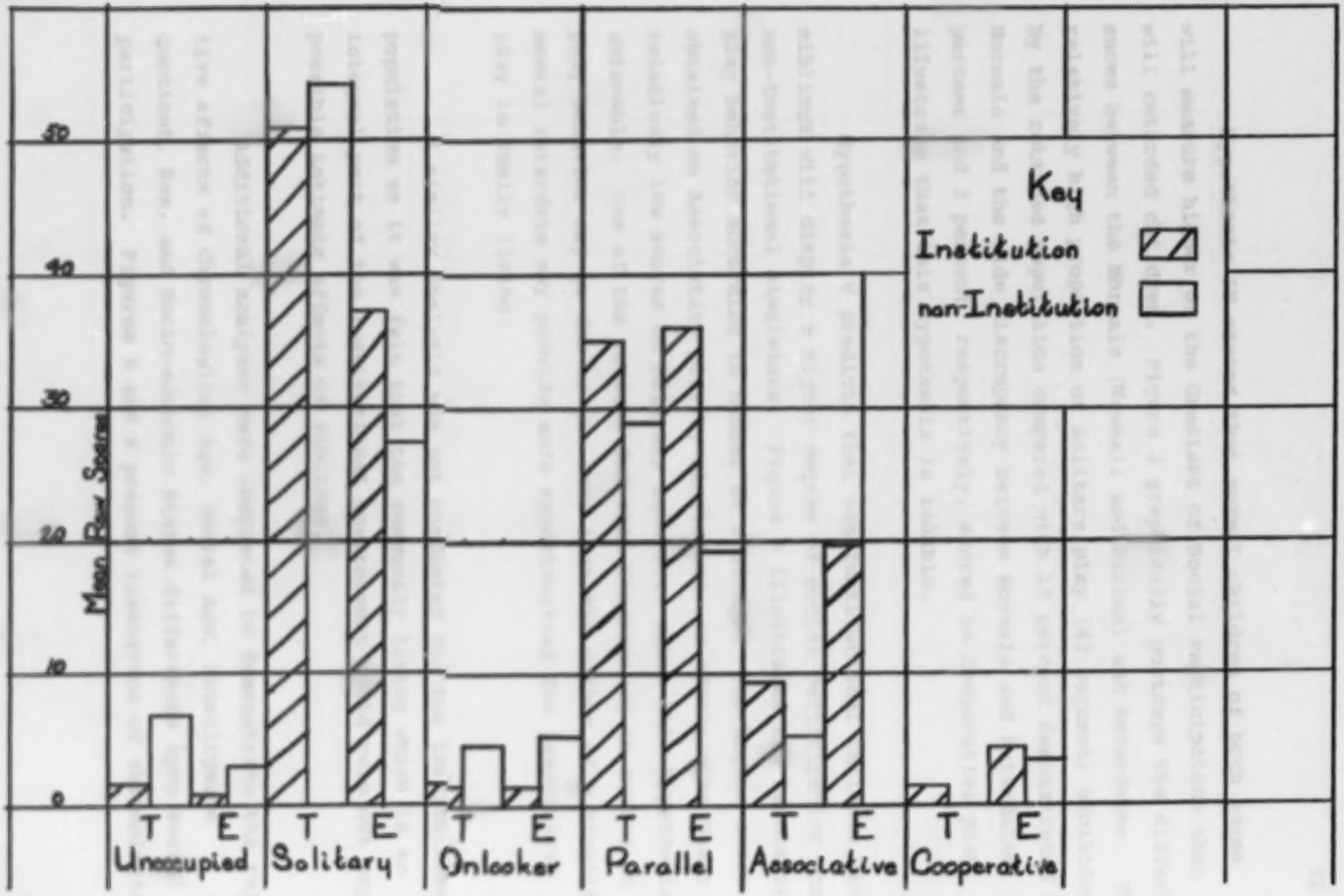

Figure 2. Play Behavior of Institutional and non-Institutional, Trainable and Educable Boys and Girls

Hypothesis IV states that normal children of both sexes will measure higher on the Gradient of Social Participation than will retarded children. Figure 3 graphically portrays the differences between the Normals (Newhall and Parten) and Retardates. The relatively high proportion of Solitary play (43 percent) exhibited by the retarded population compared with 15 percent demonstrated by Normals and the wide discrepancy between Normals and Retardates, 20 percent and 2 percent, respectively, scored on Cooperative play, illustrate that this hypothesis is tenable.

Hypothesis V predicts that non-Institutional children with siblings will display a higher degree of social participation than non-Institutional singletons. Figure 4 illustrates the levels of play behavior according to number of siblings. The higher score obtained on Associative play by singletons, in addition to their relatively low scores on Solitary behavior, makes this hypothesis untenable. One of the reasons for this discrepancy in scores on play behavior may be due to the fact that the mother of a singleton mental retardate may provide more opportunities for Associative play in family living.

A similar analysis was not completed for the Institutional population as it was felt that the community living which is an integral part of the Institutional environment would rule out any possible intimate effects of siblings.

Additional analyses were completed to demonstrate the relative effects of Chronological Age, Mental Age, Intelligence Quotient, Sex, and Socio-economic Status differences upon social participation. Figures 5 and 6 present histograms of chronological

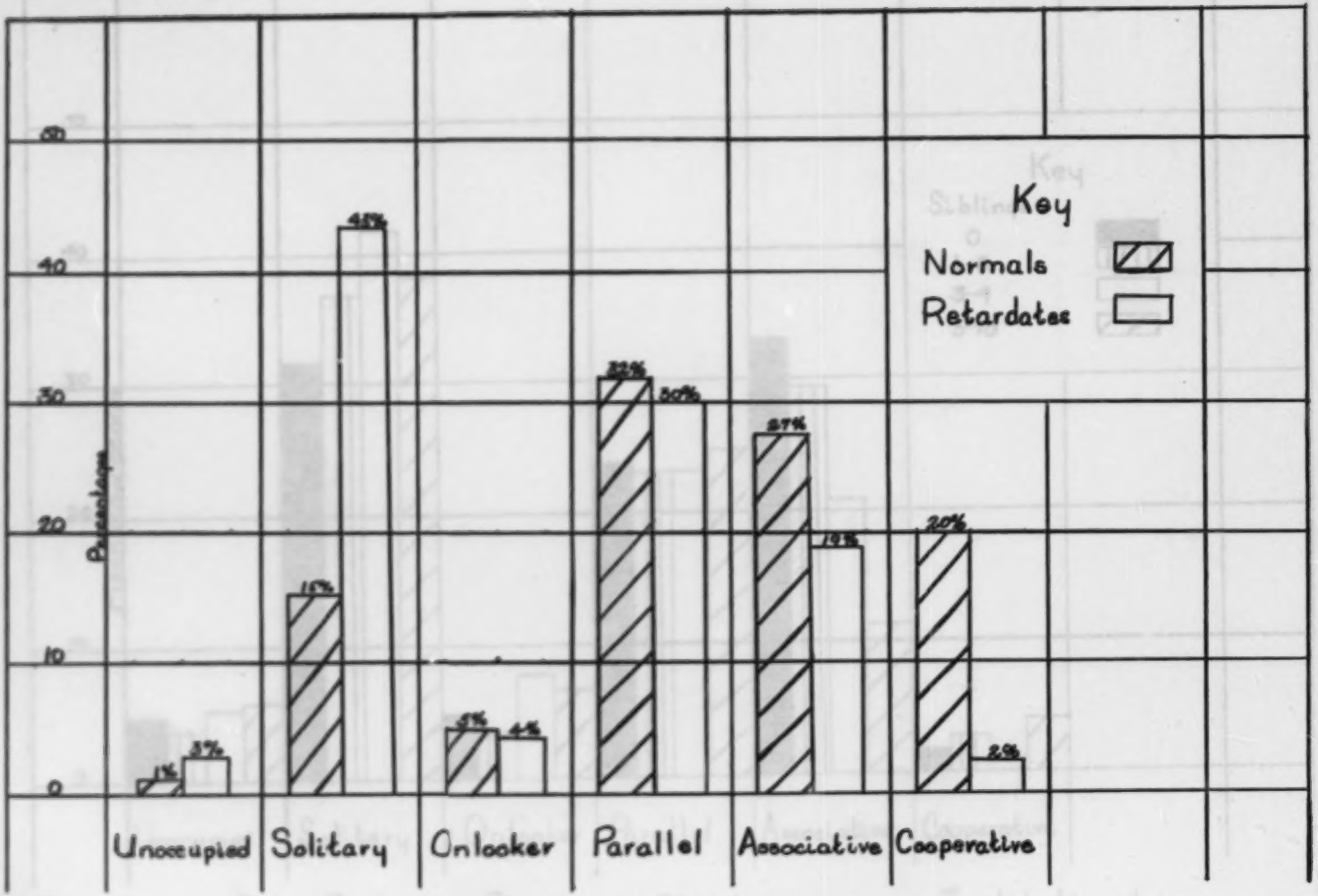

Figure 3. Comparative Play Behavior of Total Population and Normal Children (Parten and Newhall, 27)

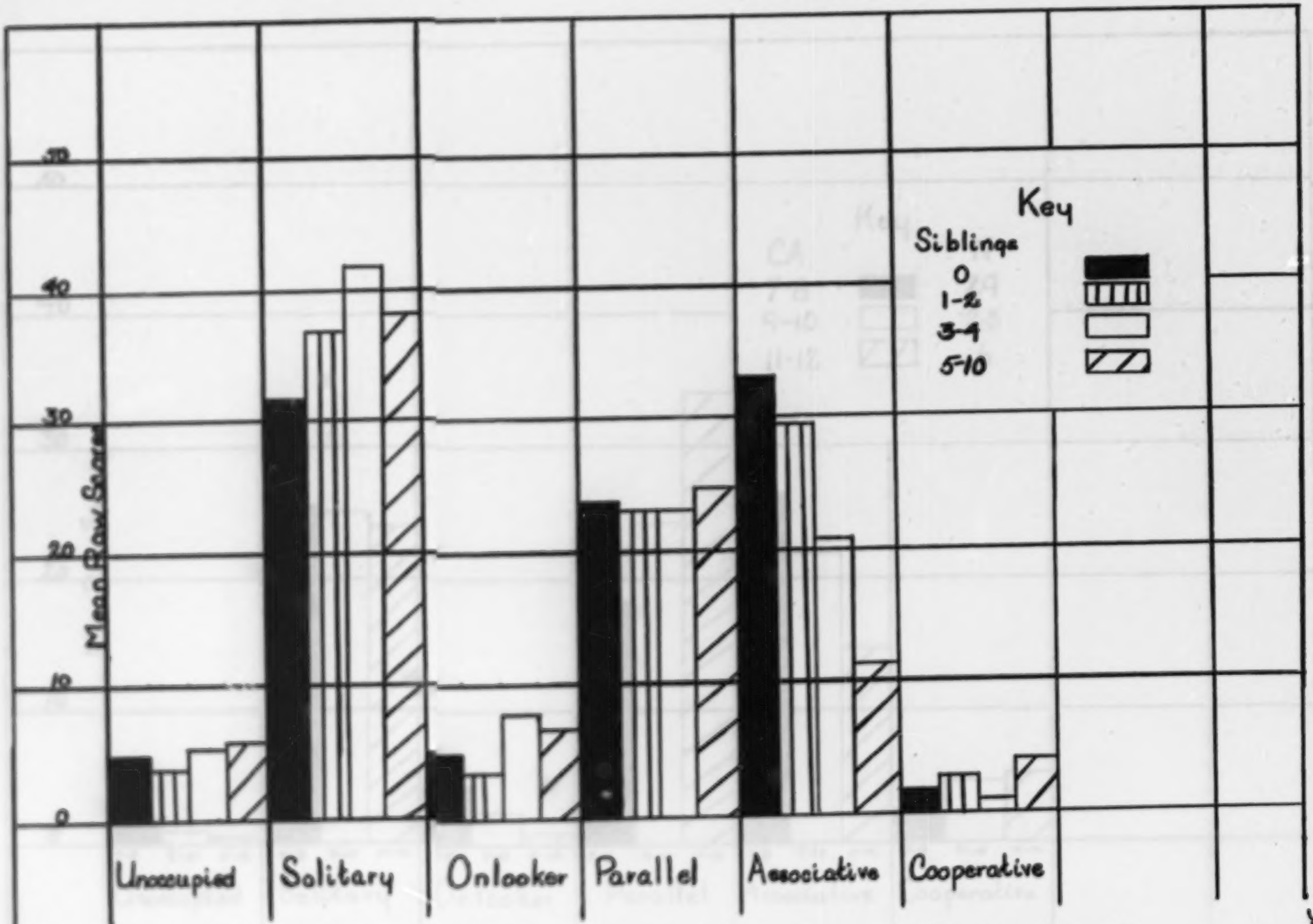

Figure 4. Play Behavior Scores of Children in non-Institutional Environments According to Number of Siblings

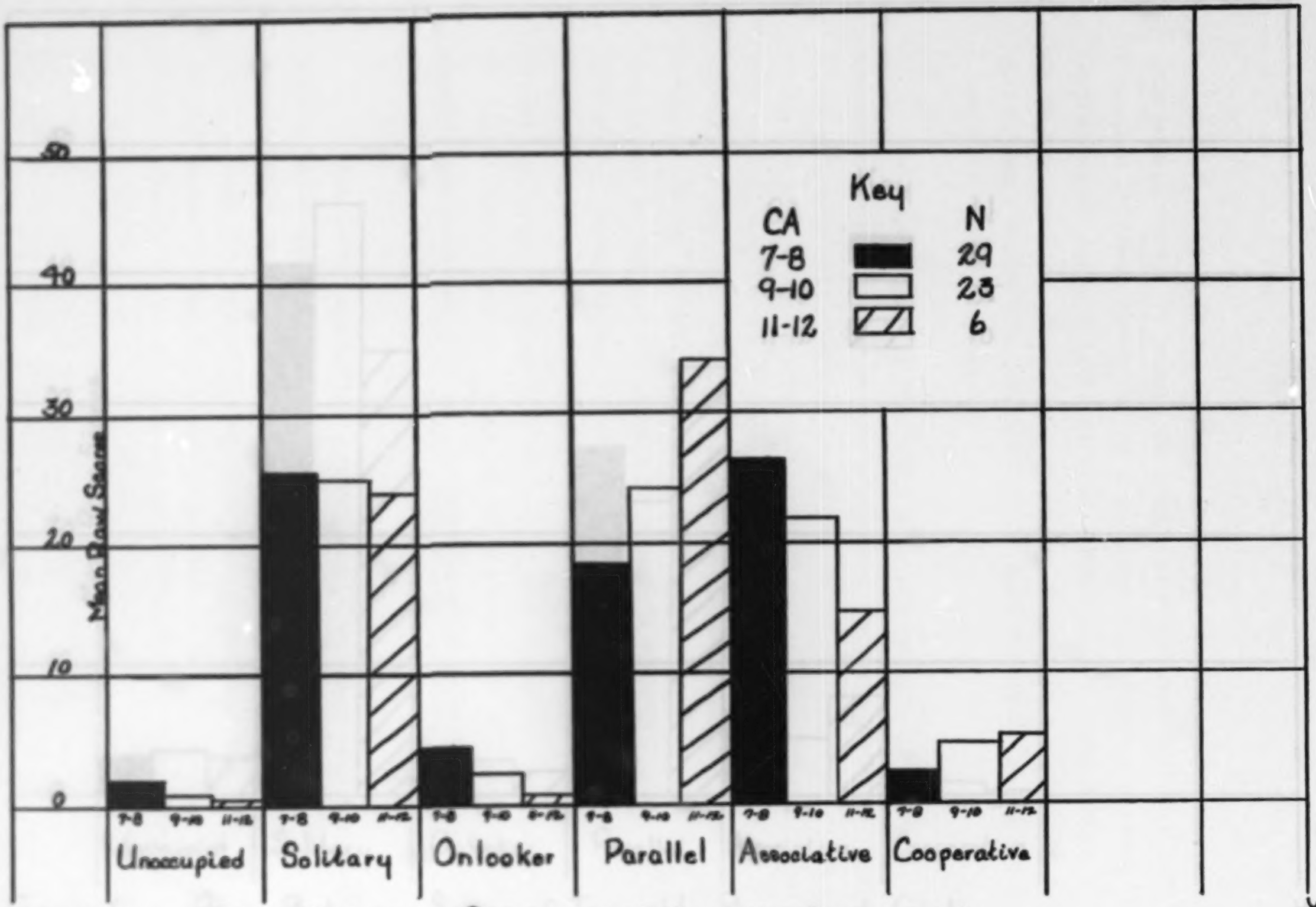

Figure 5. Play Behavior Scores of Educable Boys and Girls by CA

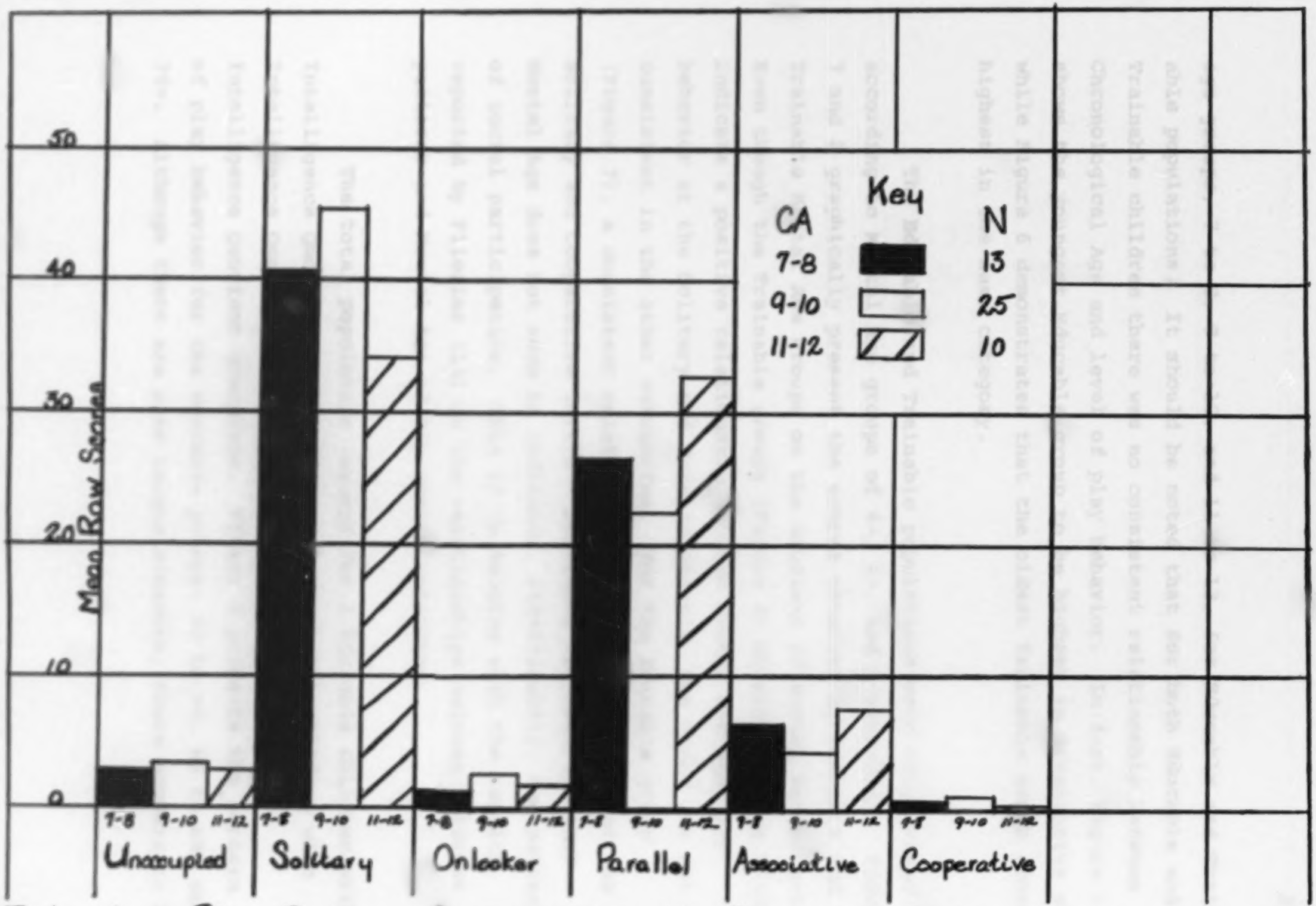

Figure 6. Play Behavior Scores of Trainable Boys and Girls by CA

age groups, 7 to 8, 9 to 10, and 11 to 12, for Educable and Trainable populations. It should be noted that for both Educable and Trainable children there was no consistent relationship between Chronological Age and level of play behavior. In fact, Figure 5 shows the youngest Educable group to be highest in Associative play, while Figure 6 demonstrates that the oldest Trainable group scores highest in the same category.

The Educable and Trainable populations were categorized according to Mental Age groups of 4-, 5-, and 6-year-olds. Figures 7 and 8 graphically present the scores obtained by Educable and Trainable Mental Age groups on the Gradient of Social Participation. Even though the Trainable groups (Figure 8) obtained scores which indicate a positive relationship between Mental Age and play behavior at the Solitary and Parallel levels, the trend was not consistent in the other categories. For the Educable group (Figure 7), a consistent relationship was exhibited only at the Solitary and Cooperative levels. According to these findings, Mental Age does not seem to influence, significantly, the pattern of social participation. This is in keeping with the results reported by Fliegler (14) on the relationships between interest patterns and Mental Age of the mental retardate.

The total population (except for 2 Educable children with Intelligence Quotients below 50, and 3 Trainable children with Intelligence Quotients above 50) was then classified into Intelligence Quotient groupings. Figure 9 presents the pattern of play behavior for the Educable groups: 50 to 59, 60 to 69, and 70+. Although there are some inconsistencies, there appears to be

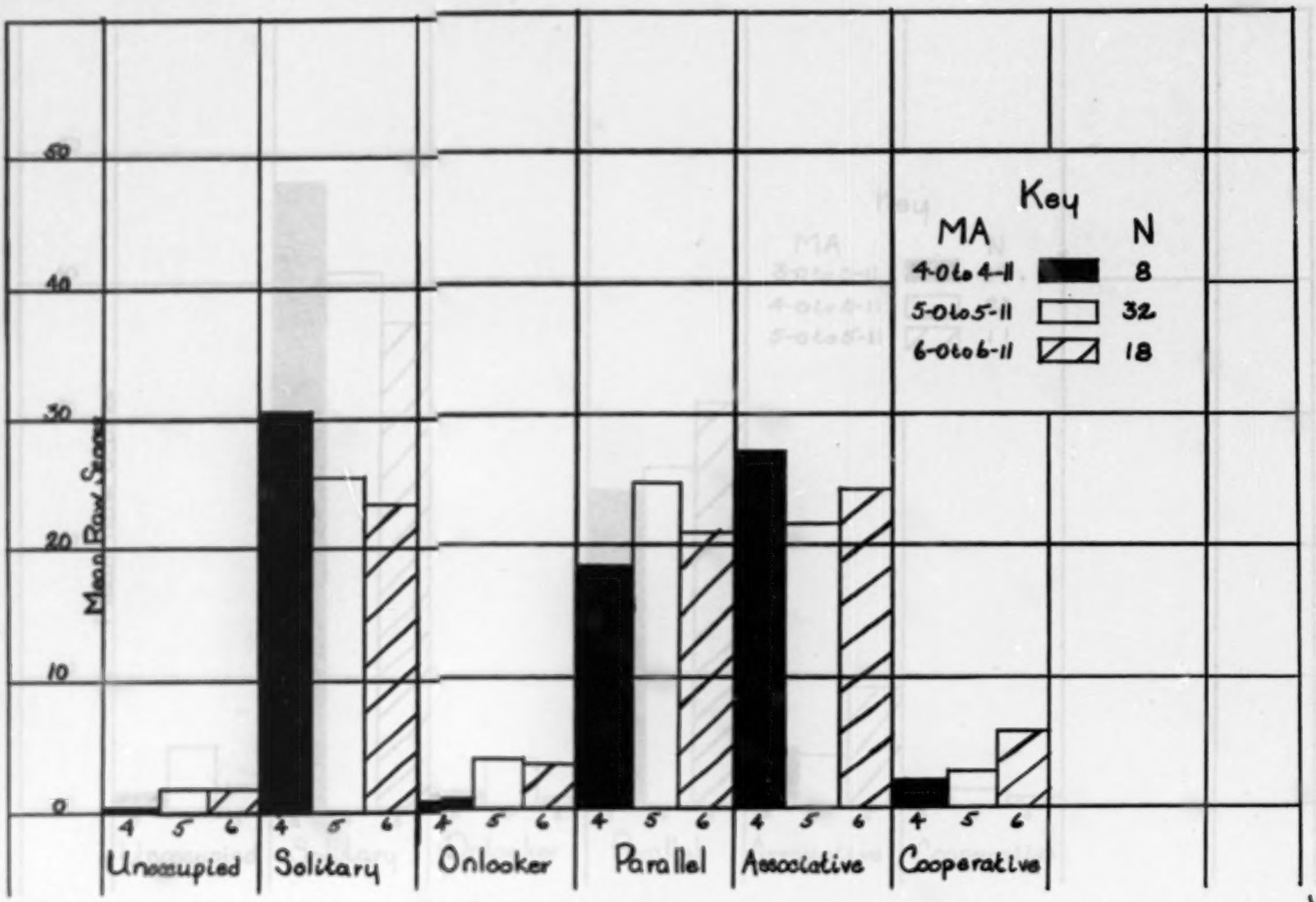

Figure 7. Play Behavior Scores of Educable Boys and Girls by MA

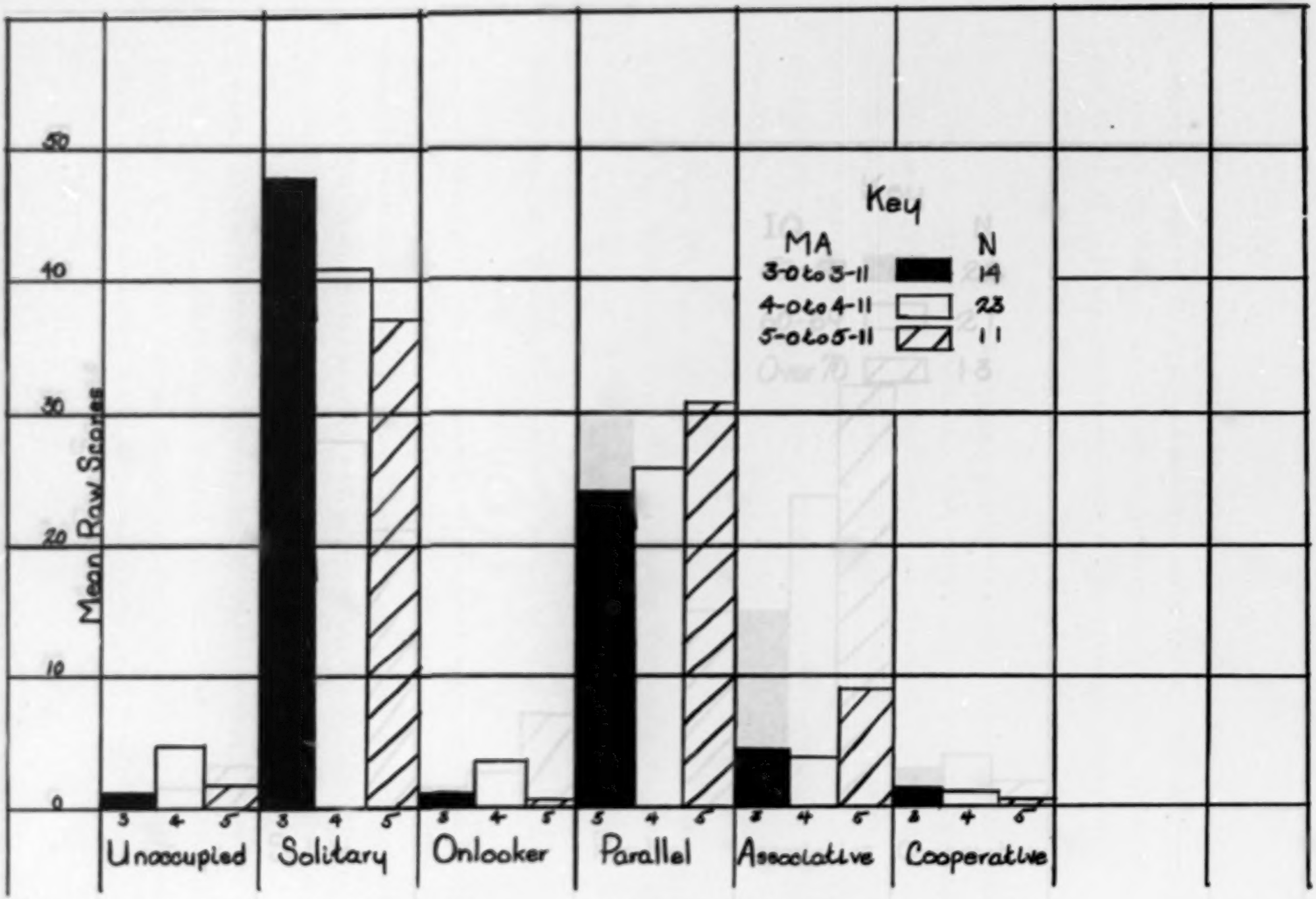

Figure 8. Play Behavior Scores of Trainable Boys and Girls by MA

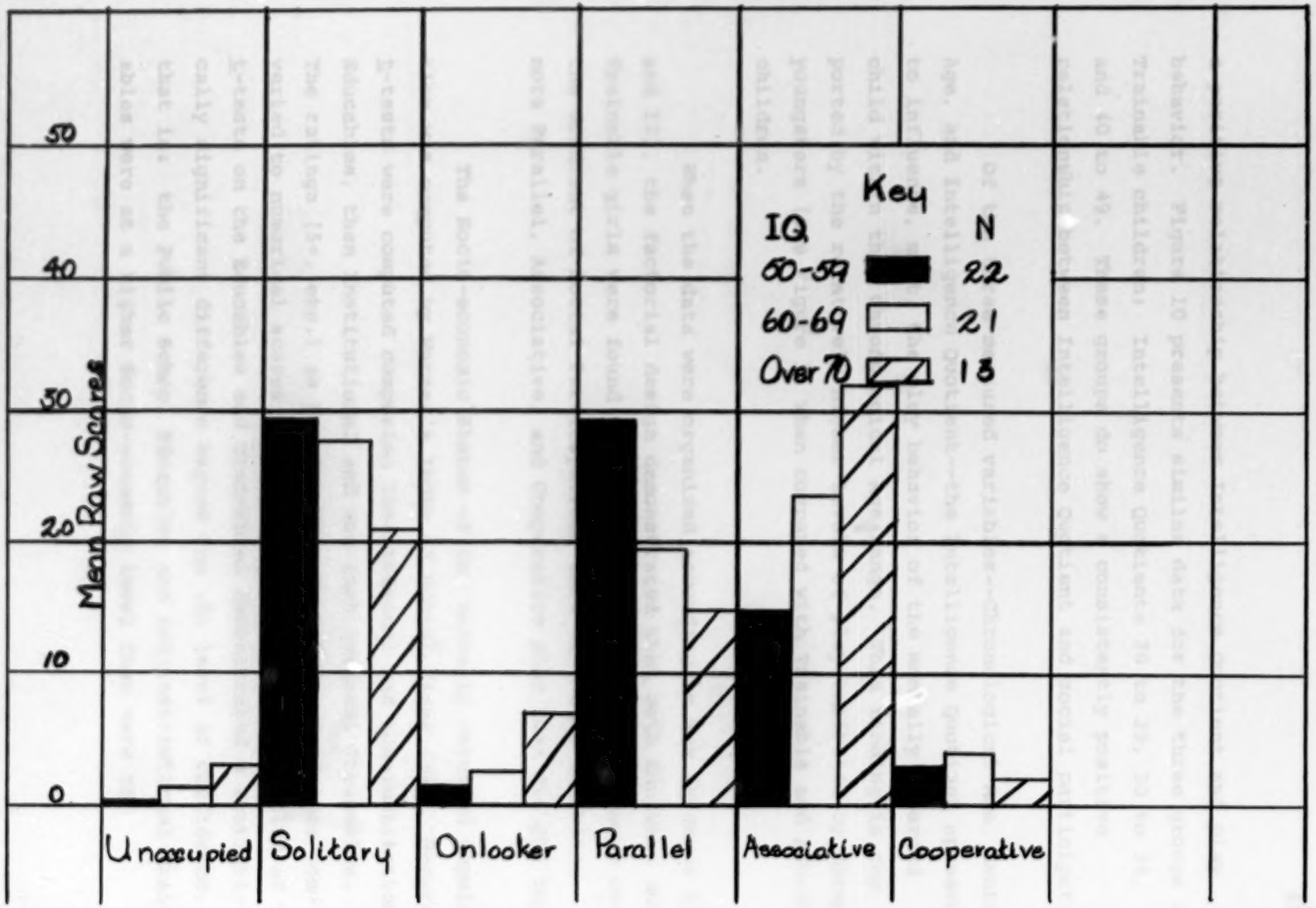

Figure 9. Play Behavior Scores of Educable Boys and Girls by IQ

a positive relationship between Intelligence Quotient and play behavior. Figure 10 presents similar data for the three groups of Trainable children: Intelligence Quotients 20 to 29, 30 to 39, and 40 to 49. These groups do show a consistently positive relationship between Intelligence Quotient and social participation.

Of the three measured variables--Chronological Age, Mental Age, and Intelligence Quotient--the Intelligence Quotient appears to influence, most, the play behavior of the mentally retarded child within this Chronological Age range. This finding is supported by the relatively higher levels of play exhibited by normal youngsters (see Figure 1) when compared with Trainable and Educable children.

When the data were organized according to Sex (Figures 11 and 12), the factorial design demonstrated that both Educable and Trainable girls were found to score somewhat higher than boys on the Gradient of Social Participation, that is: they exhibited more Parallel, Associative, and Cooperative play than did the boys.

The Socio-economic Status of the mentally retarded population was computed by Warner's Index of Social Class (34). Separate *t*-tests were computed comparing Institutional and non-Institutional Educables, then Institutional and non-Institutional Trainables. The ratings (5+, etc.) as presented in Tables I and II were converted to numerical scores as given by Warner (34). Results of the *t*-tests on the Educables and Trainables demonstrated a statistically significant difference beyond the .01 level of confidence, that is: the Public School Educables and non-Institutional Trainables were at a higher Socio-economic level than were the

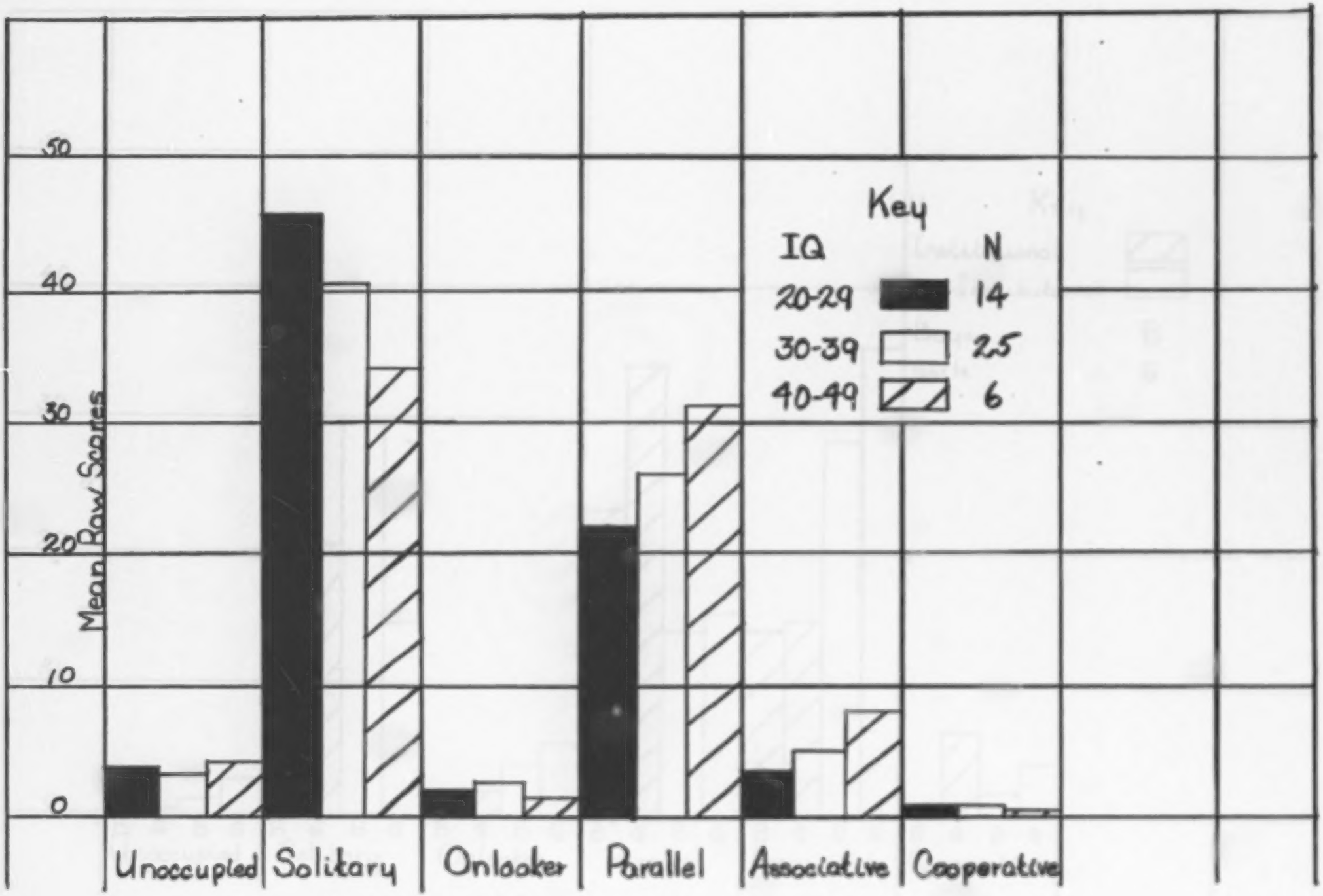

Figure 10. Play Behavior Scores of Trainable Boys and Girls by IQ

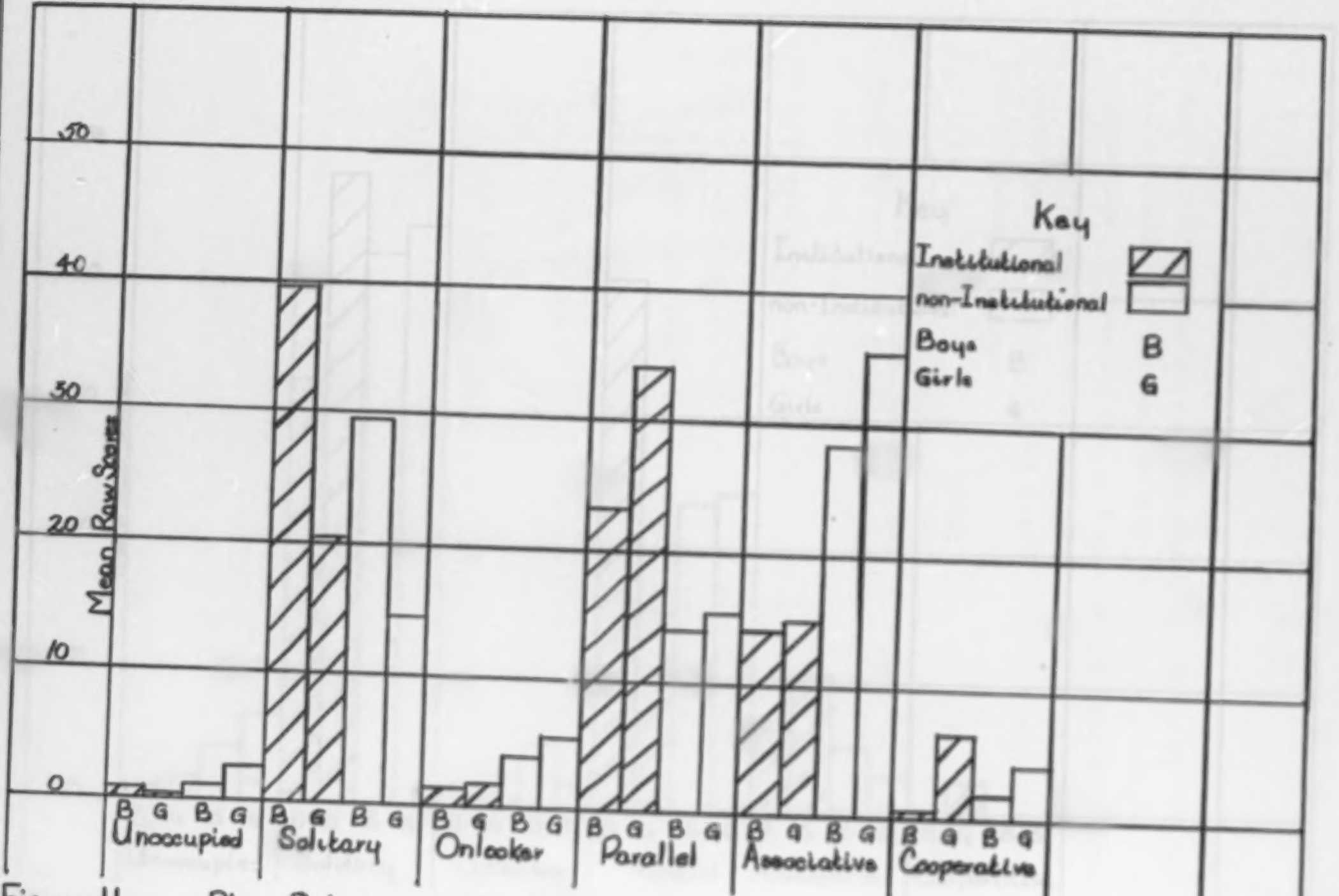

Figure 11. Play Behavior of Institutional and non-Institutional Children by Sex - Educable

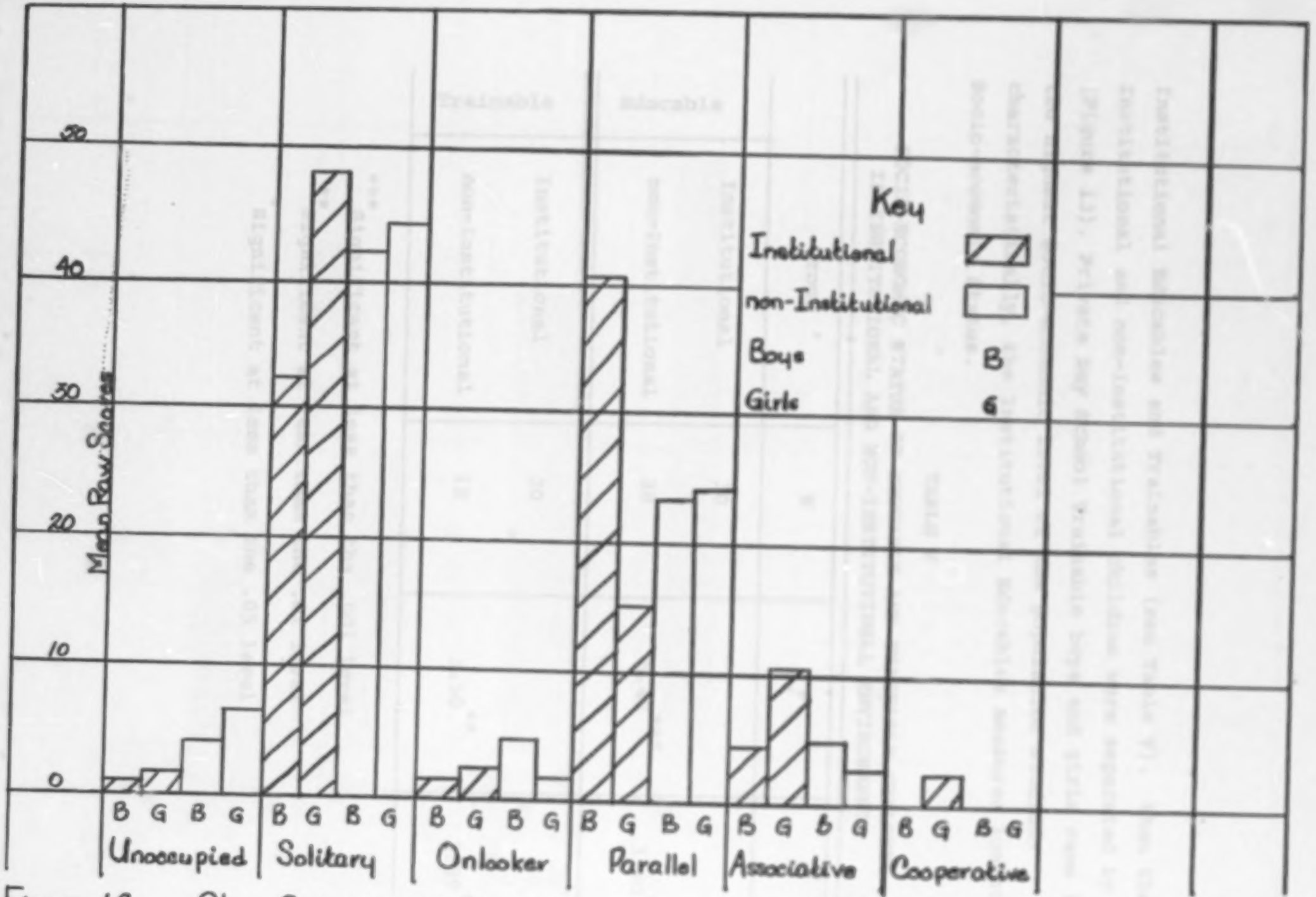

Figure 12. Play Behavior of Institutional and non-Institutional Children by Sex – Trainable

Institutional Educables and Trainables (see Table V). When the Institutional and non-Institutional children were separated by Sex (Figure 13), Private Day School Trainable boys and girls came from the highest Socio-economic level of the population studied; characteristically, the Institutional Educables measured lowest in Socio-economic Status.

TABLE V

SOCIO-ECONOMIC STATUS OF EDUCABLE AND TRAINABLE CHILDREN IN INSTITUTIONAL AND NON-INSTITUTIONAL ENVIRONMENTS

	Group	N	F	t
Educable	Institutional	30		
	non-Institutional	28	8.42***	3.80**
Trainable	Institutional	30		
	non-Institutional	18	3.50**	3.39**

***Significant at less than the .001 level

**Significant at less than the .01 level

*Significant at less than the .05 level

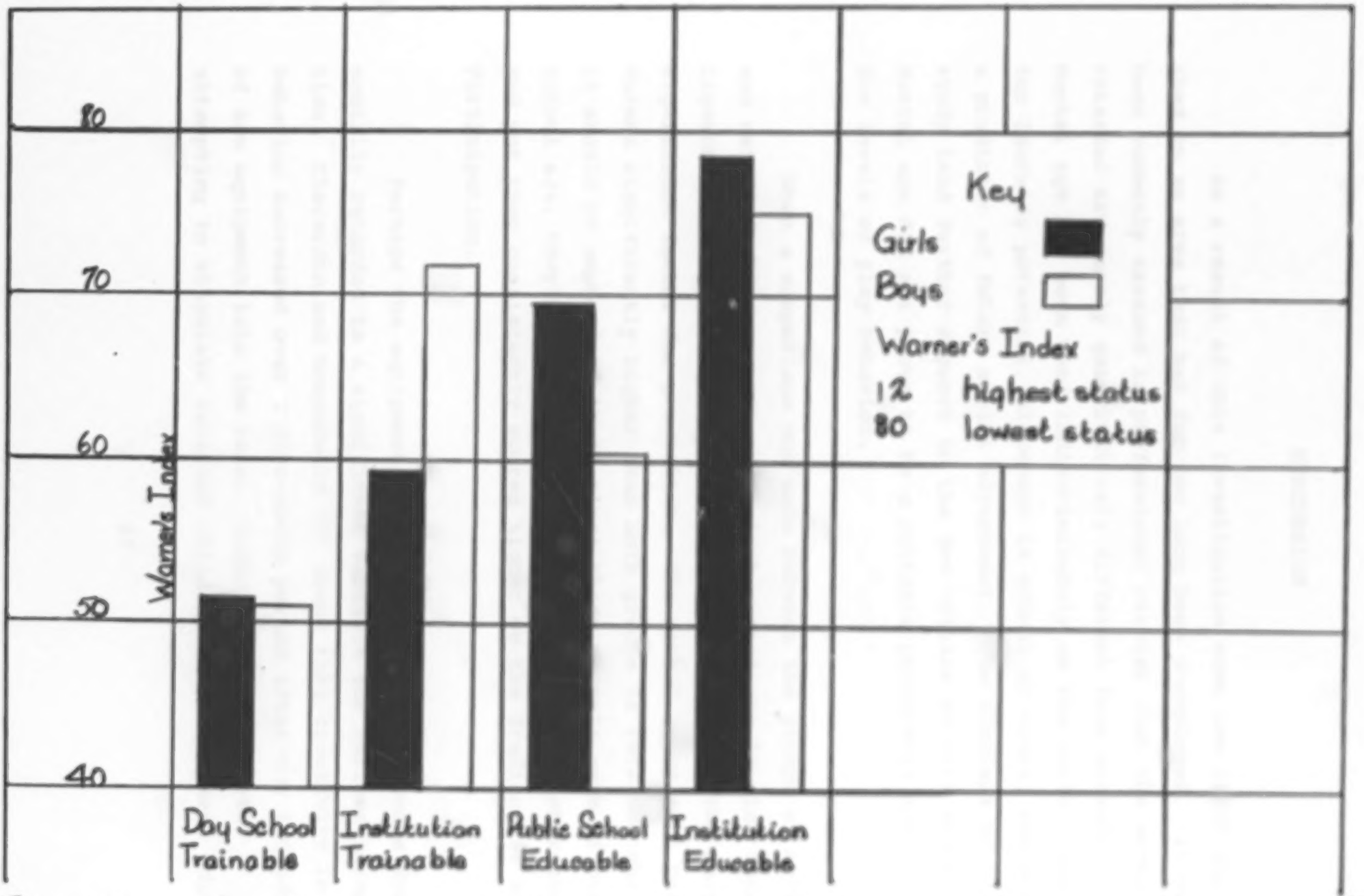

Figure 13. Mean Socio-Economic Status of Total Population - Lower Scores Represent Higher Status

DISCUSSION

As a result of this investigation some new light has been shed on an area that has for too long been unexplored. It has been commonly assumed in professional circles that the mentally retarded are merely quantitatively different from normals. Mental age has been used indiscriminately as the basic criterion for learning potential, placement in school or class, and even as a predictor of future social adjustment. The findings of this study lend further support to the few critics of this practice. Mental age did not prove to be a suitable prognostic indicator for levels of play behavior.

When a comparison was made between the groups of normal and retarded children with equivalent mental age levels, Intelligence Quotient rather than Mental Age proved to be the more significant factor for prediction. The normal group (27) performed significantly higher than both groups of retarded children. It should be emphasized that, since these normals were of preschool age, they were considerably younger than the retardates and yet they consistently scored higher on the Gradient of Social Participation.

Perhaps the equipment usually found in classrooms for the mentally retarded is a significant variable for further investigation. Cleverdon and Rosenzweig (9) found that creativity in play behavior increased over a five-month period after the introduction of new equipment into the room. Unfortunately, however, attempting to stimulate retarded children with equipment which is

geared to mental age level does not consider interest level, and it has been demonstrated by Fliegler (14) that mental age has no consistent effect upon the interest level of mental retardates.

Undoubtedly, the personality of the teacher has a direct impact upon the behavior exhibited by the children. It was demonstrated, during the course of this investigation, that the level of play behavior for one particular class of Educables increased considerably over the five-month period of observations. It was apparent that the stimulating techniques used by this teacher were of superior quality to those demonstrated in other classrooms, despite similarity of physical plant and equipment.

The value levels assigned to the categories of the Gradient of Social Participation is another factor to be considered. Solitary play is labeled as low in social participation and Cooperative play as high. It is difficult, if not impossible, for a child to be scored on the higher level of this scale if he is engaged in creative behavior such as writing a story, painting, or clay modeling. These activities would be scored solitary and be given a low rating. But the highly aggressive youngster who engages in Associative play and takes over leadership by force would be rated high in social participation. In other words, does social participation--"the degree to which each child participates in various social activities" (27, p. 509)--actually measure the social adaptability of the child being observed? It would seem that the quality of the youngster's play should be taken into consideration.

Before further generalizations may be formulated regarding the play behavior of mentally retarded and normal children, a more rigorously controlled experiment should be conducted utilizing sample populations from both groups. Perhaps a revision of the play behavior scale should be attempted, carefully defining each of the categories on the continuum, for it was found that the Onlooker and Associative behaviors were sometimes vague and misleading when applied in observation.

Another significant area of inquiry would be a study of the factors which lead to different types of behavior. This would entail the construction of a teacher evaluation instrument, a rating scale for physical plant and equipment, and a careful evaluation of trends over the observation periods.

Perhaps the most significant finding of this investigation was the failure to support Hypothesis II. The difference between performances of Institutional and non-Institutional children was not statistically significant. The slightly higher levels of play behavior exhibited by non-Institutional Educables were counterbalanced by the higher levels of activity demonstrated by Institutional Trainables. The t-test for Educables demonstrated that the non-Institutional Educables were significantly higher in socio-economic level than were Institutional children. This difference may, in no small way, have influenced the higher levels of play behavior exhibited by the non-Institutional Educables. To attribute this difference to environment, alone, ignores the rejection of Hypothesis II and does not take into consideration the very important variable, socio-economic status.

SUMMARY

1. The results of the factorial design demonstrated:

   a. a statistically significant difference (.001 level) in favor of Educable children over Trainable in Total Play Behavior Scores; as defined in Procedure;

   b. no statistically significant difference between Institutional and non-Institutional subjects on Total Scores; and

   c. a significant difference (.01 level), in favor of female subjects over males in Total Play Behavior scores.

2. Normal children of both sexes were found to measure higher than mentally retarded children on the Gradient of Social Participation.

3. There was no apparent relationship between the scores on the Gradient of Social Participation of singletons and those of children with siblings.

4. For both Educable and Trainable groups there was no consistent relationship between Chronological Age and level of play behavior.

5. Mental Age does seem to influence, significantly, the pattern of social behavior in the mentally retarded.

6. **The Intelligence Quotient appears to influence most, the social participation of the mentally retarded child within the 8 to 12 year chronological age range.**

omit 7. **The Educable Public School children were found to be characteristic of a higher socio-economic class, according to Warner's Index of Social Class.**

APPENDIX

The Gradient of Social Participation was taken from the Degrees of Social Participation scale devised by Parten and Newhall (27, pp. 512-513) in their study on Social Behavior of Preschool Children.

DEGREES OF SOCIAL PARTICIPATION

Unoccupied Behavior.--The child apparently is not playing at all, at least not in the usual sense, but occupies himself with watching anything which happens to be of momentary interest. When there is nothing exciting taking place, he plays with his own body, gets on and off chairs, just stands around, follows the teacher, or sits in one spot glancing around the room.

Solitary Play.--The child plays alone and independently with toys that are different from those used by the children within speaking distance and makes no effort to get close to or speak to the other children. His interest is centered upon his own activity, and he pursues it without reference to what others are doing.

Onlooker Behavior.--The child spends most of his time watching the others play. He often talks to the playing children, asks questions, or gives suggestions, but does not enter into the play himself. He stands or sits within speaking distance of the group so that he can see and hear all that is taking place. Thus he differs from the unoccupied child, who notices anything that happens to be exciting and is not especially interested in groups of children.

Parallel Play.--The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys which are like those which the children around him are using, but he plays with the toys as he sees fit and does not try to influence the activity of the children near him. Thus he plays beside rather than with the other children (cf. solitary play above).

Associative Play.--The child plays with other children. There are borrowing and lending of play material; following one another with trains and wagons; mild attempts to control which children may or may not play in the groups. All engage in similar if not identical activity; there is no division of labor and no organization of activity. Each child acts as he wishes, does not subordinate his interest to the group.

Cooperative or Organized Supplementary Play.--The child plays in a group that is organized for the purpose of making some material product, of striving to attain some competitive goal, of dramatizing situations of adult or group life, or of playing formal games. There is a marked sense of belonging or not belonging to the group. The control of the group situation is in the hands of one or two members who direct the activity of the others. The goal, as well as the method of attaining it, necessitates a division of labor, the taking of different roles by the various group members, and the organization of activity so that the efforts of one child are supplemented by those of another.

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